SENSITIVE VERTEBRATE SPECIES

Peregrine Falcon (*Falco peregrinus anatum*)

The peregrine falcon was delisted as an endangered species nationally in 1999 (USFWS 1999), and is now listed by the USFS as a regionally sensitive species. A Recovery Plan for the Rocky Mountain/Southwest population of the American peregrine falcon was approved in December 1984. The Recovery Plan (USFWS 1984a) outlines General Protective Measures, which include: 1) discouraging land-use practices and development which adversely alter or eliminate the character of the hunting habitat or prey base within ten miles and the immediate habitats within one mile of the nesting cliff, 2) restricting human activities and disturbances between February 1 and August 31 (in excess of those which have historically occurred at the sites) which occur within one mile of the nesting cliff, and 3) discouraging/eliminating the use of pesticides and other environmental pollutants which are harmful and would adversely affect the peregrine or its food sources.

Suitable habitat for peregrine falcons may be divided into three parts: 1) cliff or substrata upon which eggs are laid and young are reared (nest sites), 2) surrounding territory where food is obtained (hunting sites), and 3) migration and wintering areas. Most peregrine eyries in Utah are situated upon high ledges on mountain cliff faces and river gorges (USFWS 1984a). There are records of peregrines nesting on low dikes in Utah marshes, but these are exceptions due to the abundance of prey and lack of human disturbance. Nests are usually located on open ledges or potholes with a southern exposure. Cliffs are generally composed on one of the following rock types: sandstone, limestone, quartzite, or volcanic rock. The heights of cliffs range from 40-400 feet and average 178 feet (Porter and White 1973). Peregrines nest from the lowest elevations in the region to above 9,000 feet. In the Rocky Mountain Region, the majority of known pairs are near ponderosa pine forests or pinyon-juniper woodlands (USFWS 1984a).

Prey is the major factor in nest site selection. Nest sites are often adjacent to water courses and impoundments due to prey abundance in these areas. Marshes, croplands, meadows, river bottoms, and lakes are important components of peregrine hunting sites. Prey species are primarily small to medium-sized terrestrial birds, shorebirds, and waterfowl, and are normally found within ten miles of the eyrie (known extreme is 17 miles) (USFWS 1984a). The wet areas provide food for the peregrines year-round, but are especially important during the nesting season (Porter and White 1973).

Peregrines generally breed at two to three years of age. Territories are established in March. Three to four eggs are laid mid-April in a scrape on a cliff ledge. Young are hatched in mid-May and fledge after six weeks (Spahr et al. 1991). Porter and White (1973) believed some peregrines winter in marshes adjacent to the Utah and Great Salt Lakes.

Several factors have led to past population declines in the peregrine falcon: 1) effects of DDT, its metabolites, and other chlorinated hydrocarbons on peregrine reproduction, 2) drying up of marshes which support the peregrines' prey base, 3) killing of individuals by firearms, 4) death due to botulism, 5) predation of eggs or young, 6) destruction of nesting cliffs for mining and construction, and 7) general human encroachment (Porter and White 1973).

Peregrines are most susceptible to disturbance during the courtship and nest establishment period with susceptibility decreasing as the young are raised (USFWS 1984a). Disturbances such as pollution, shooting, nest site and habitat destruction, photographers, removing of birds/eggs, botulism, and effects of DDT during critical reproduction periods all have potentially severe consequences (Porter and White 1973).

With the recent delisting, a Monitoring Plan for the American Peregrine Falcons in the United States prescribes monitoring of peregrine falcon territories every third year beginning in 2003 and ending in 2015 (USFWS 2003). The Fishlake National Forest continues to survey suitable habitat on the Forest annually, however there have been no eyries located on the Forest.

Spotted Bat (*Euderma maculatum*)

Spotted bats inhabit a variety of communities including open ponderosa pine, desert scrub, pinyon-juniper, open pastures, and hay fields. They roost alone in rock crevices located high on steep rock faces in limestone or sandstone cliffs. Crevices range from 0.8-2.2 inches in width. Roost sites are usually in relatively remote and undisturbed areas. There is some evidence that spotted bats exhibit roost site fidelity. Availability of suitable roost sites and impacts of human disturbance are the limiting factors to this species' success.

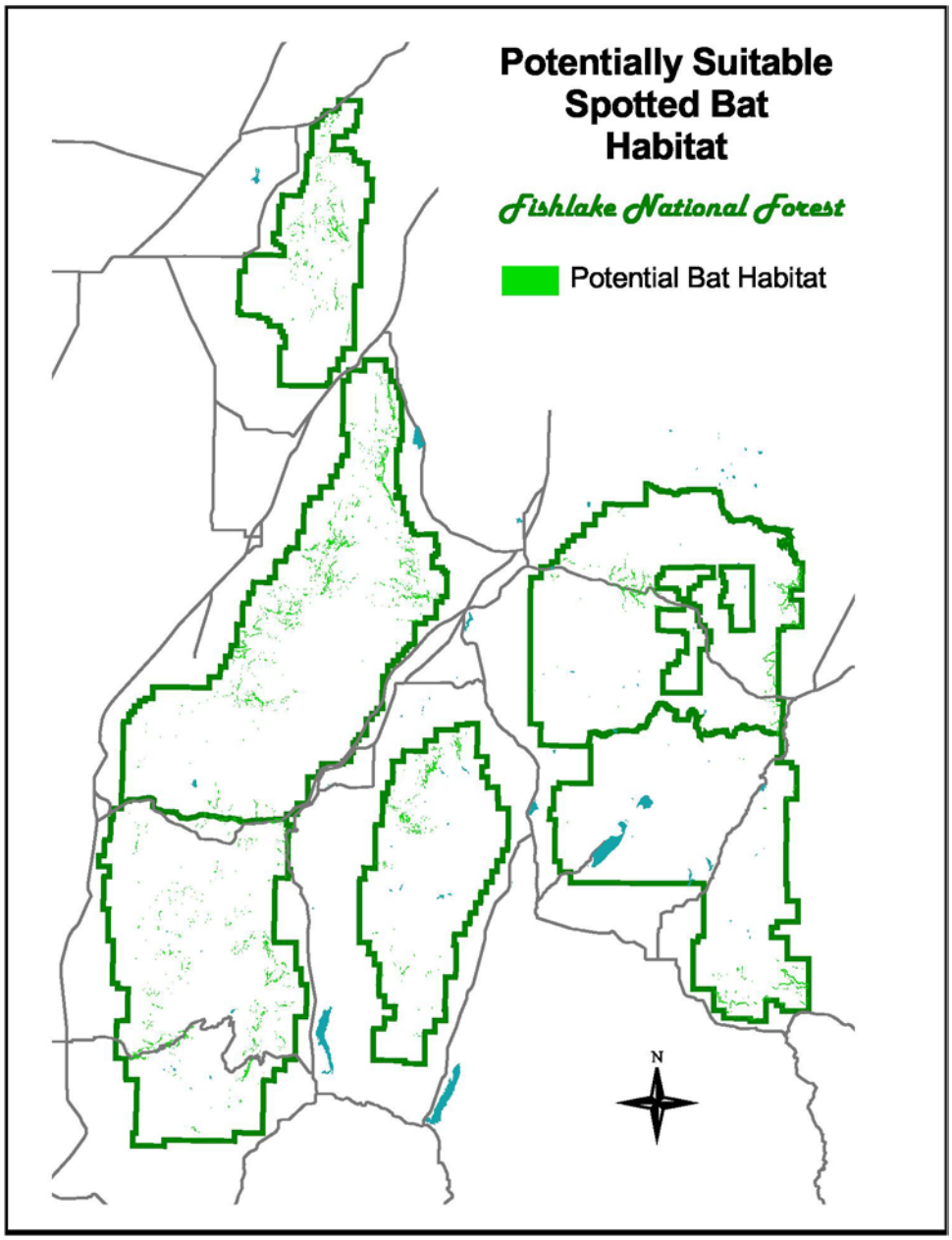
Spotted bats are known to be rare. They breed from late February to early April and give birth to one young in late May or early June (Spahr et al. 1991). Spotted bats are strong fliers and have been observed to move up to 10 km from roosts or capture sites. Spotted bats forage primarily in flight on larger insects such as Lepidoptera, but have also been seen foraging on the ground for grasshoppers (Toone 1992). They use echolocation to avoid flying into each other while foraging. Moths are thought to be their main prey species (Spahr et al. 1991).

Spotted bats occur in scattered areas in British Columbia, Idaho, southeastern Oregon, southwestern Montana, western Wyoming, Nevada, Utah, western Colorado, southeastern California, Arizona, western New Mexico, and south to the Mexican state of Queretaro. Little is known about their seasonal movements, but they are thought to migrate south for winter hibernation (Spahr et al. 1991).

Human disturbance to hibernacula from cave exploration and bat banding has been found to cause significant declines of bat populations (Gillette and Kimbrough 1970, Mohr 1972, both cited in Christy and West 1993). Other threats to bats are the establishment of dams that flood hibernacula (DeBlase et al. 1965, Griffin 1953, Hall 1962, all cited in Christy and West 1993) and the application of pesticides, which reduces food abundance and subjects the bats to contaminated prey (Clark 1981).

Surveys conducted on several sites on the Fishlake National Forest in 1996 resulted in no documented occurrences of this species (Foster et al. 1996). However, to date no forest-wide surveys have been conducted and the species is only a suspected resident.

Displayed below is a map of potentially suitable habitat across the forest.


Potentially Suitable
Spotted Bat
Habitat
Fishlake National Forest
Potential Bat Habitat
N

Townsend's Big-eared Bat (*Corynorhinus townsendii*)

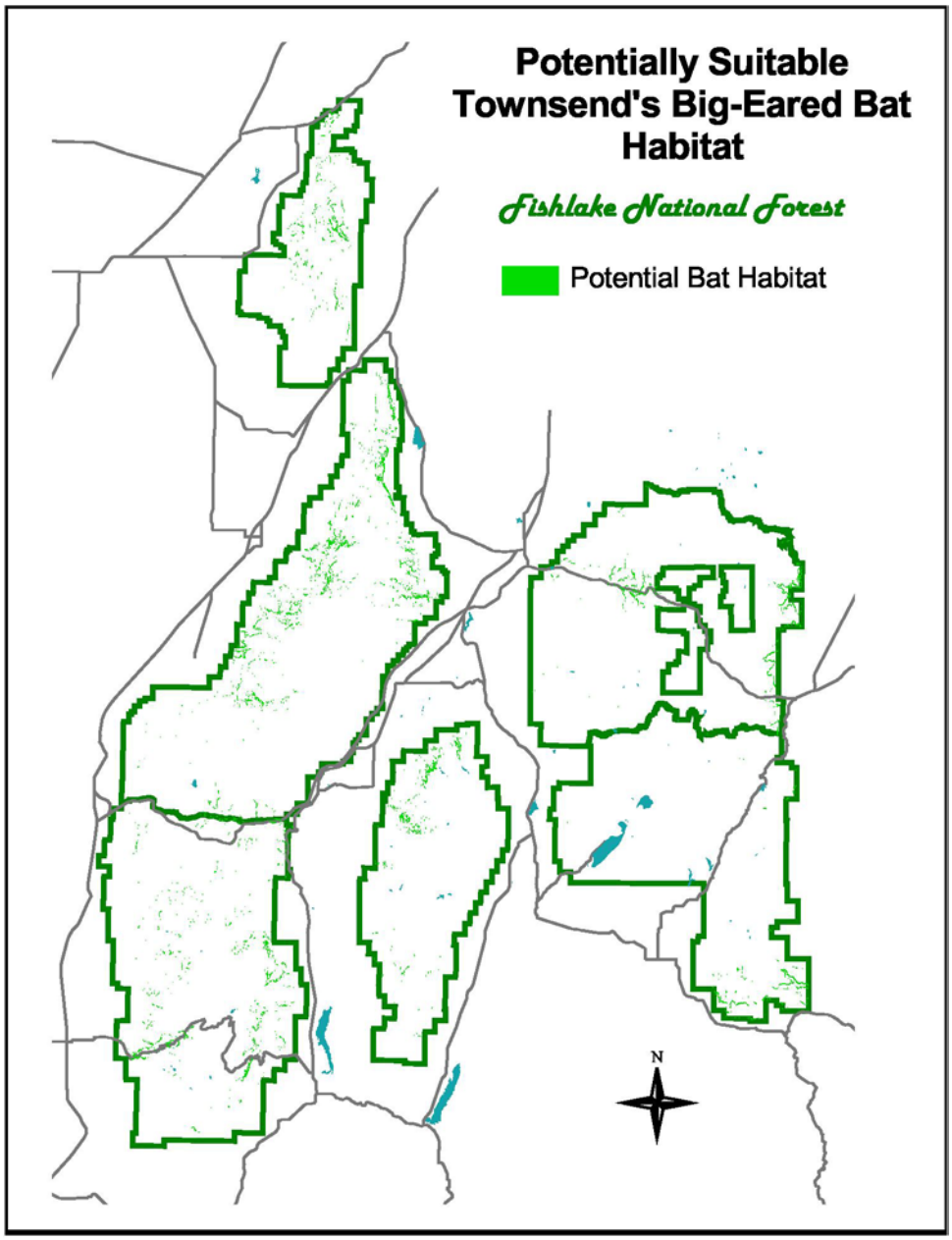
The Townsend's big-eared bat inhabits juniper/pine forests, shrub/steppe grasslands, deciduous forests, and mixed-conifer forests located at elevations between sea level and 10,000 feet. Caves, rocky outcrops, old buildings, and mine shafts provide suitable roost sites for this species. The low reproductive rate, limited availability of roost sites, and effects of human disturbance are considered limiting factors for this species (Spahr et al. 1991).

Western (Townsend's) big-eared bats are insectivores, eating mostly moths. Breeding occurs at winter roost sites between October and February. Because fertilization occurs during winter months, females do not give birth until late spring or early summer. Each female usually gives birth to one offspring. Females and young roost in communal nurseries, which range in size from 12-200 individuals. The offspring fly at three weeks and are weaned in six to eight weeks. Nurseries break up by August. During the winter, bats of this species roost singly or in small clusters in hibernacula from October to February. They do not migrate, but occasionally move to different roosts or hibernacula, presumably in response to temperature changes (Spahr et al. 1991).

The western big-eared bat occurs throughout western North America, from British Columbia to southern Mexico, and east to South Dakota, and west to Texas and Oklahoma. Isolated populations exist in southern Missouri, northwestern Arkansas, northeastern Oklahoma, eastern Kentucky, West Virginia, and western Virginia. They are widely distributed throughout the Intermountain Region (Spahr et al. 1991).

Surveys were conducted at several sites on the Fishlake National Forest in 1996 (Foster et al. 1996) with no bats of this species located. However, in 2003, Townsend's big-eared bats were found roosting in an abandoned mine in Millard County on the Fishlake National Forest. Possible day roosts, night roosts, hibernation roosts, and staging roosts for maternity colonies of this species were evaluated. Ten of thirty-four mine openings evaluated appeared to serve as roost sites for the Townsend's big-eared bat (Diamond and Diamond 2003).

Displayed below is a map of potentially suitable habitat across the forest.


Potentially Suitable
Townsend's Big-Eared Bat
Habitat
Fishlake National Forest
Potential Bat Habitat
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Northern Goshawk (*Accipiter gentilis*)

Northern goshawks are associated with coniferous, deciduous, and mixed forest throughout much of the Northern hemisphere (Reynolds et al. 1992). Studies of nesting habitat show that goshawks nest in older-aged forests with variable tree species (Shuster 1980, Reynolds 1975, 1978, Saunders 1982, Moore and Henny 1983, Hall 1984). The principal forest types occupied by the goshawk in the Southwest are ponderosa pine, mixed-species, and spruce-fir (Reynolds et al. 1992). The most consistent vegetative characteristic of goshawk nest sites is a high percent canopy closure (Reynolds et al. 1992). Goshawks typically nest in stands with canopy cover between 60% and 80% (Crocker-Bedford and Chaney 1988). Studies of habitat characteristics at goshawk nest sites have reported average canopy closure measurements from 75% in northern California to 88% in northwestern California (Saunders 1982, Hall 1984). Stand structure ranges from dense multi-layered stands in Oregon (Reynolds 1978) to open park-like understories in Colorado and California (Shuster 1980, Saunders 1982, Hall 1984). Average nest tree size is just as variable, with mean tree diameters ranging from 8-20 inches in Colorado (Shuster 1980), 20 inches in Oregon (Moore and Henny 1983), and 36 inches in northwestern California (Hall 1984).

Goshawks appear to prefer north to east aspects for nest sites (Moore and Henny 1983, Reynolds 1978, Shuster 1980, Hall 1984), as tree stands within these aspects are typically denser and more suitable (Reynolds 1987). Slope also appears important, as nests are usually placed on flat to moderately sloped (1-40 % grade) land where trees are larger and grow at a higher density (Reynolds 1978, Shuster 1980, Reynolds et al. 1992). Hennessy (1978) observed that there was a tendency for goshawks to build nests near or on trails, edges, dirt roads, or other clearings such that clear flight lanes were provided to and from the nest.

The importance of the proximity of the nest area to water is not known. Moore and Henny (1983) found that the distance of water from nests averaged approximately 650 feet. Hall (1984) found an average distance of 500 feet. Shuster (1980) found that nests were rarely further than 900 feet from water. Hennessy (1978) found an average of 1300 feet in Utah. Crocker-Bedford and Chaney (1988) suggested that a permanent water source is not required, but there may be a preference for this condition.

Reynolds and Meslow (1984) found that the goshawk is a height-zone generalist, taking prey from the ground-shrub and shrub-canopy layers. Bloom et al. (1986) stress the importance of meadows, streams, and aspen stands, which may be important for prey species on which the goshawk feeds. However, Bartelt (1977) observed that goshawks forage in a variety of habitats, probably along edge as well as in deep forests, and Schnell (1958) even observed a goshawk wading through water to prey on ducklings. Moore (1980) also noted use of edge. The presence of prey plucking sites within the nesting territory is also a habitat characteristic related to foraging. Prey plucking sites usually consist of stumps, fallen logs, snags, or arched trees (Bartelt 1977, McCarthy et al. 1989, Schnell 1958). In Oregon and California studies, goshawks were found to forage primarily on birds and mammals (Reynolds 1975, 1978, Bloom et al. 1986). In northern Arizona, Boal and Mannan (1991) found that the golden-mantled ground squirrel, cottontail rabbit, Steller's jay, and northern flicker were the primary prey species.

Available evidence suggests that two important resources, food and nest habitat, are the principle mechanisms limiting goshawk densities (Newton 1989, 1991). Specifically, populations may be limited by shortage of nest sites; and where nest sites are readily available, densities may be limited by food abundance and availability (Newton 1991).

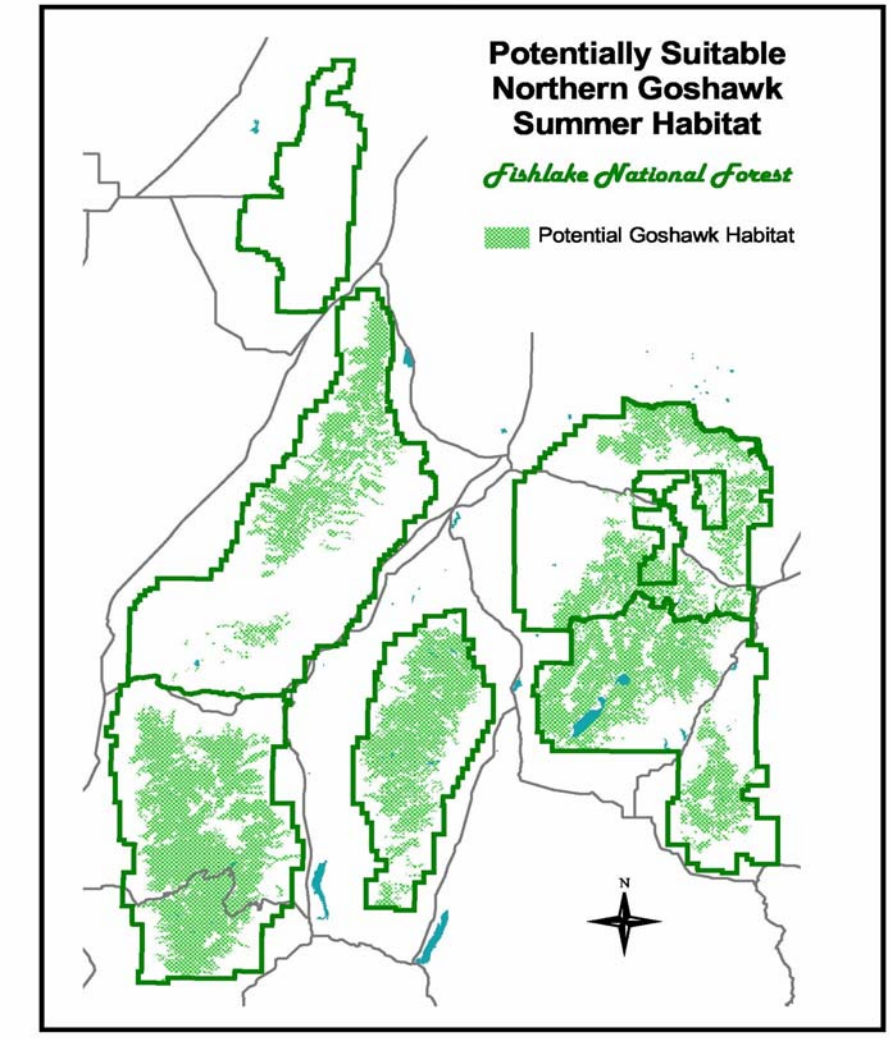
Goshawks begin breeding activities in April (McGowan 1973, Moore 1980, Hennessy 1978). Nests are typically large stick platform structures built in a fork near the trunk of the tree, on a large branch, or on top of a mistletoe whorl, 15-50 feet from the ground, just below the crown (Eng and Gullion 1962, McGowan 1973, Bartelt 1977, Moore 1980, Saunders 1982, Hall 1984, Hennessy 1978, Shuster 1980,

Reynolds 1987, Bloom et al. 1986). Clutches of 2-4 eggs are laid in mid-May, and incubation lasts about 30 days, with the nestling period extending through mid-July (Reynolds 1975, Moore 1980). Young are fledged between July 15 and August 15 and may be dependent on adults for food until September 30 (Hennessy 1978, Reynolds 1975). Goshawks typically build more than one nest, placing alternates in adjacent trees or up to half a mile away (Reynolds et al. 1992, McGowan 1973). Goshawks may alternate between these nests on an annual or semi-annual basis, may use the same nest for years in a row, or build a new nest in the same area (Reynolds 1975, Reynolds and Wight 1978, Reynolds et al. 1992, McGowan 1973).

The northern goshawk is Holarctic in distribution. In North America it occurs primarily in boreal forests, but it also occurs far to the south in montane forests of the western United States and Mexico. The most widespread subspecies (*A. g. atricapillus*) occurs from the northeastern United States across the boreal forests of Canada to Alaska and southward through the upland forests of the western United States (Reynolds et al. 1992). The goshawk is partly migratory in the northern portion of its range, where in winters of food shortage it migrates southward (Mueller and Berger 1967). In high elevations and montane areas, some goshawks descend into lower elevations of woodlands, riparian areas, and scrublands during the winter (Kennedy unpublished data cited in Reynolds et al. 1992).

Surveys have been conducted on all Ranger Districts across the forest following the Region 4 protocol. 44 nests have been documented on the Fishlake National Forest. This number can vary as a result of high winds and other natural events that can affect nests. The 44 known nests comprise 26 territories. Nesting activity across the Forest generally averages from 8-12 nests annually. An active nest is defined, as nests where adults are present and incubating, or where young are present in or at the nests. An occupied territory is when birds have been monitored in the larger territory but no nesting activity has been confirmed. In this case nesting may have occurred, however, it was not confirmed.

Displayed below is a map of potentially suitable goshawk summer habitat across the Forest. There are approximately 1,454,356 acres of potentially suitable habitat on the Forest.



The Utah Northern Goshawk Conservation Strategy and Agreement are being implemented on the Fishlake National Forest. The Forest recognizes this document for its sound ecological base, and is implementing the principals contained within. Furthermore, the Forest recognizes this publication as the best science available on goshawk management in Utah. Based on the data evaluated for this Strategy and the publication The Northern Goshawk in Utah: Habitat Assessment and Management Recommendations by Graham et al. (1999), goshawk populations are stable in Utah. In addition to these programmatic sources of science, the Forest is implementing the 1999 Utah Northern Goshawk Project Environmental Assessment**,** which provides standards and guidelines for individual forest plan amendments.

Flammulated Owl (*Otus flammeolus*)

Flammulated owls appear to be associated with mature pine and mixed-conifer habitat types (Reynolds and Linkhart 1984). In the West, they typically occur within the yellow pine belt, which includes ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*Pinus jeffreyi*) (Reynolds et al. 1989, Marshall 1957, Marcot and Hill 1980). Flammulated owls have also been found in stands of fir (*Abies* spp.), Douglas fir (*Pseudotsuga menziesii*), and incense cedar (*Libocedrus decurrensen*) (Marshall 1939, Reynolds and Linkhart 1984). Undergrowth of oak/pine mix may be a required habitat component in some portions of its range (Phillips et al. 1964).

Radio-telemetry studies of foraging and habitat use by flammulated owls in Colorado (Linkhart 1984, Reynolds and Linkhart 1987) and nesting studies in Oregon (Bull and Anderson 1978) showed the owls' preference to forage in old-growth (>200 years old) ponderosa pine/Douglas fir stands over other forest types and ages available within the study area. Goggans (1985) found that flammulated owls monitored in Oregon foraged in edge habitat between forests and grasslands significantly more than these types occurred within their home range, and that the relative proportions of arthropods (flammulated owls' main prey species) were greatest in grassland habitat.

Flammulated owls are obligate secondary cavity nesters, and rely on previously excavated cavities in large diseased or dead trees for nest habitat (Bull and Anderson 1978, Reynolds et al. 1989). Possible limitations to this species include the availability of suitable habitat, which is decreasing due to logging of mature forest stands, and loss of prey associated with such practices (Reynolds et al. 1989).

Flammulated owls are almost exclusively insectivorous, preying on small to medium-sized moths, beetles, caterpillars, crickets, spiders, scorpions, and other arachnids. Breeding begins in May when pair formation and nest site selection take place. Clutches of two to three eggs are laid in natural or flicker-sized woodpecker holes in early June. Young are hatched after a 21-22 day incubation period and fledge in late July. They disperse from the natal area by September. In mid-October, flammulated owls migrate to wintering grounds in Mexico and Central America. Flammulated owls are distributed from southern British Columbia south to Vera Cruz, Mexico and from the Rocky Mountains to the Pacific during breeding. In winter, their range is thought to extend from central Mexico to Guatemala and El Salvador (Spahr et al. 1991).

No inventory specific to the flammulated owl has been conducted on the Fishlake National Forest. A Mexican spotted/multi-species owl inventory conducted in 1992 did record flammulated owl vocalizations on the Loa Ranger District. To date no nests have been documented on the Fishlake National Forest.

Three-toed Woodpecker (*Picoides tridactylus*)

Three-toed woodpeckers are found in northern coniferous and mixed forest types located at elevations up to 9,000 feet and composed of Engelmann spruce, sub-alpine fir, Douglas fir, grand fir, ponderosa pine, tamarack, aspen, and lodgepole pine (Spahr et al. 1991, Gabrielson and Jewett 1940, Farner 1952, Larrison and Sonnenberg 1968, Marshall 1969, Bent 1939). This species is attracted to areas where there are numerous dead trees due to a fire, insect epidemic, blow-down, or other die-off (Bent 1939, Spring 1965, Larrison and Sonnenberg 1968). Nests are found in cavities located 3-50 feet above ground in spruce, tamarack, pine, cedar, and aspen trees (Bent 1939, Spahr et al. 1991). This species uses a variety of tree species as foraging substrata; fire-killed trees appear to be preferred. In Colorado, this woodpecker was found to prefer old growth and mature trees for foraging; in Oregon they have been observed foraging on lodgepole pine trees with an average breast height diameter (DBH) of 9.4 inches and height of 59 feet. Because this species requires snags for feeding, perching, nesting, and roosting, it is threatened by activities such as logging and fire suppression, which remove or eliminate snags (Spahr et al. 1991).

This species feeds off of wood-boring insect larvae, mostly beetles, but they also eat moth larvae and occasionally sap at sapsucker pits (Spahr et al. 1991). They are major predators of the spruce bark beetle and may contribute to its control (Bent 1939). Three-toed woodpeckers breed in May and June. Both sexes excavate the nest cavity in a dead or occasionally live tree where they incubate an average of four eggs for 12-14 days. Young fledge at 22-26 days and remain with the parents for another month (Spahr et al. 1991).

Three-toed woodpeckers range across North America from tree line south to southern Oregon and through Idaho and Utah to New Mexico and Arizona. In eastern North America they are found south to Minnesota, southern Ontario, New York, and northern New England. They also occur across northern Europe and Asia (Spahr et al. 1991). In the Intermountain Region, densities are presumed to be low; however, little information is available. Utah is of high importance to three-toed woodpeckers because 26-50 % of the species' total breeding distribution is in Utah (Parrish et al. 2002).

The three-toed woodpecker is a Utah Partners in Flight priority species according to Parrish et al. (2002). The classification is based on a number of criteria, some of which include: population trend uncertainty, non-breeding threats, and winter distribution. They list the three-toed woodpecker as an ecological specialist, with extensive threat to breeding range due to a 26-50 % loss of habitat.

Formal Forest-wide inventories for this species have been conducted on the Richfield, Loa and Beaver Ranger Districts. As a result of these inventories, numerous nests were located on Monroe Mountain. Monitoring of nest success as well as the success of mitigation measures was part of a study conducted by Brigham Young University. In the Engelmann spruce habitat type of Monroe Mountain, 71 of 251 survey points showed occurrences of three-toed woodpeckers (Hill et al. 2002). Monitoring data resulted in improved mitigation measure recommendations for snag retention.

Greater Sage grouse (*Centrocercus urophasianus*)

Greater sage grouse are distributed from central Washington, southern Idaho, Montana, southern Alberta and Saskatchewan, north-central Oregon, western North Dakota south to eastern California, Nevada, Utah, Colorado, and Wyoming (Johnsgard 1983).

Sage grouse are dependent on sagebrush-dominated habitats (Klebenow 1973). Sagebrush is an essential part of sage grouse brood habitat, nesting cover, and year-round diet (Call 1979). Open areas such as swales, irrigated fields, meadows, burns, roadsides, and areas with low, sparse sagebrush cover are used as leks (Klebenow 1973). Leks are usually surrounded by areas with 20-50 % sagebrush cover (Call 1979).

Males gather on the leks (strutting grounds) early in March, and claim territories before breeding begins (Wallestad 1975). Within 7-10 days following copulation, the hen builds a nest in the vicinity of the lek (Autenrieth 1981, Johnsgard 1983, Wallestad 1975). Clutch size ranges from 7-8 eggs, with incubation lasting about 26 days. Chicks fly by 2 weeks of age, although their movements are limited until they are 2-3 weeks old (Wallestad 1975). Juveniles are relatively independent by the time they have completed their first molt at 10-12 weeks of age (Johnsgard 1983).

Sage grouse lack a muscular gizzard and cannot grind and digest seeds; they must consume soft-tissue foods. The year-round diet consists of leafy vegetation with the exception of some insects taken during the summer. Sage grouse will eat the evergreen sagebrush throughout the year (Wallestad 1975). Additionally, sage grouse will use forbs and rarely perennial bunchgrasses for food. They are highly selective grazers, choosing only a few plant genera. Insects are a minor diet item for adult sage grouse (Barnett and Crawford 1994). In a Utah study, Welch et al. (1991) found that sage grouse, while expressing preference for big sagebrush, are capable of shifting their eating habits. In their first week of life, sage grouse chicks consume primarily insects, especially beetles from the family Scarabeidae. Their diet then switches to forbs, with sagebrush gradually assuming primary importance (Klebenow and Gray 1968).

Sage grouse apparently do not require open water for day-to-day survival if succulent vegetation is available. However, they utilize free water if it is available. Sage grouse distribution is apparently seasonally limited by water in some areas. In summer, sage grouse in desert regions occur only near streams, springs, and water holes (Call 1979).

Sveum et al. (1998) in Washington suggest that nest success is related to herbaceous cover near the nest site. Lack of adequate nesting and brooding cover may account for high juvenile losses in many regions (Kindschy 1986). Taller, denser herbaceous cover apparently reduces nest predation and likely increases early brood survival. Generally, the quantity and quality of habitats used by sage grouse control the degree of predation. Thus, predation would be expected to increase as habitat size and herbaceous cover within sagebrush decrease (Braun 1998). Predator species including coyote (*Canis latrans*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), eagles, crows, ravens, magpies, and hawks (Dunkle 1977) prey on adult and juvenile sage grouse (Kindschy 1986).

Sage grouse are habitat-specific to one particular plant type in meeting their life requirements. Destruction of habitat has been the basic cause of sage grouse decrease throughout the West. Sage grouse once occurred virtually everywhere sagebrush did (Call 1979). Sage grouse have declined primarily because of loss of habitat due to overgrazing, elimination of sagebrush, and land development (Hamerstrom and Hamerstrom 1961).

There are known populations of sage grouse on the Richfield and Loa Ranger Districts. Sage grouse have been documented on the south end of Monroe Mountain near the Hell's Hole and Forshea Mountain areas. Sage grouse have been documented using these areas in spring through winter with one

documented lek. Sage grouse have also been documented on the lower Mytoge Mountain near the Forest boundary and also near Forsyth Reservoir near Highway 72. They have been documented during the summer months on the upper Mytoge, Sevenmile, and the Tidwell Slopes. Because little information exists on the Fishlake National Forest, a determination concerning trend is difficult. However, low population numbers have been documented throughout the West; therefore, it is assumed that Forest populations are in similar condition. Ongoing surveys will continue in cooperation with the Utah Division of Wildlife Resources.

Pygmy Rabbit *(Brachylagus idahoensis)*

Pygmy rabbits are generally limited to areas of deep soils with tall, dense sagebrush, which they use for cover and food (Flath 1994, Green and Flinders 1980a, Green and Flinders 1980b, Campbell et al. 1982, Weiss and Verts 1984). Individual sagebrush plants in areas inhabited by pygmy rabbits are often 6 feet (1.8 m) or more in height (Flath 1994). Dense stands of big sagebrush along streams, roads, and fencerows provide dispersal corridors for pygmy rabbits (Green and Flinders 1980b, Weiss and Verts 1984). Pygmy rabbits are seldom found in areas of sparse vegetative cover, and seem to be reluctant to cross open space (Bradfield 1975).

The pygmy rabbit is the only native Leporid that digs burrows. Juveniles use burrows more than other age groups. When pygmy rabbits can utilize sagebrush cover, burrow use is decreased. Burrows are usually located on slopes at the base of sagebrush plants, and face north to east. Tunnels widen below the surface, forming chambers, and extend to a maximum depth of about 3.3 feet (1 m). In areas where soil is shallow, pygmy rabbits live in holes among volcanic rocks, in stone walls, around abandoned buildings, and in burrows made by badgers and marmots (*Marmota flaviventris*) (Bradfield 1975, Green and Flinders 1980b).

Pygmy rabbits may be active at any time of day; however, they are generally most active at dusk and dawn. They usually rest near or inside their burrows during midday (Janson 1946 in Green and Flinders 1980b). Some researchers have found that pygmy rabbits never venture further than 70 feet (21.3 m) from the burrows (Bradfield 1975). However, Bradfield (1975) observed pygmy rabbits range up to 328 feet (100 m) from the burrows.

Some areas inhabited by pygmy rabbits are covered with several feet of snow for up to 2 or more months during the winter (Green and Flinders 1980b). Pygmy rabbits will use tunnels beneath the snow (Flath 1994), and during periods when the snow has covered most of the sagebrush, pygmy rabbits tunnel beneath the snow to find food. Snow tunnels are approximately the same height and width as underground burrows. Aboveground movement during the winter months is restricted to these tunnel systems (Bradfield 1975).

The range of the pygmy rabbit includes most of the Great Basin and some of the adjacent intermountain areas of the western United States (Green and Flinders 1980b). Pygmy rabbits are found in southwestern Montana from the extreme southwest corner near the Idaho border north to Dillon and Bannack in Beaverhead County (Flath 1994). Distribution continues east to southern Idaho and southern Oregon and south to northern Utah, northern Nevada, and eastern California as well as isolated populations occurring in east-central Washington (Bradfield 1975) and Wyoming (Campbell et al. 1982).

The elevational range of pygmy rabbits in Nevada extends from 4,494 to over 7,004 feet (1,370-2,135 m) and in California from 4,986 to 5,298 feet (1,520-1,615 m) (Green and Flinders 1980b). In Utah they have been located as high as 8,400 feet (Kreig Rasmussen per. Com).

The primary food of pygmy rabbits is big sagebrush, which may comprise up to 99% of the food eaten in the winter and 51% in the summer (Bradfield 1975, Green and Flinders 1980a). Grasses and forbs are also eaten from mid to late summer (Green and Flinders 1980a, Green and Flinders 1980b).

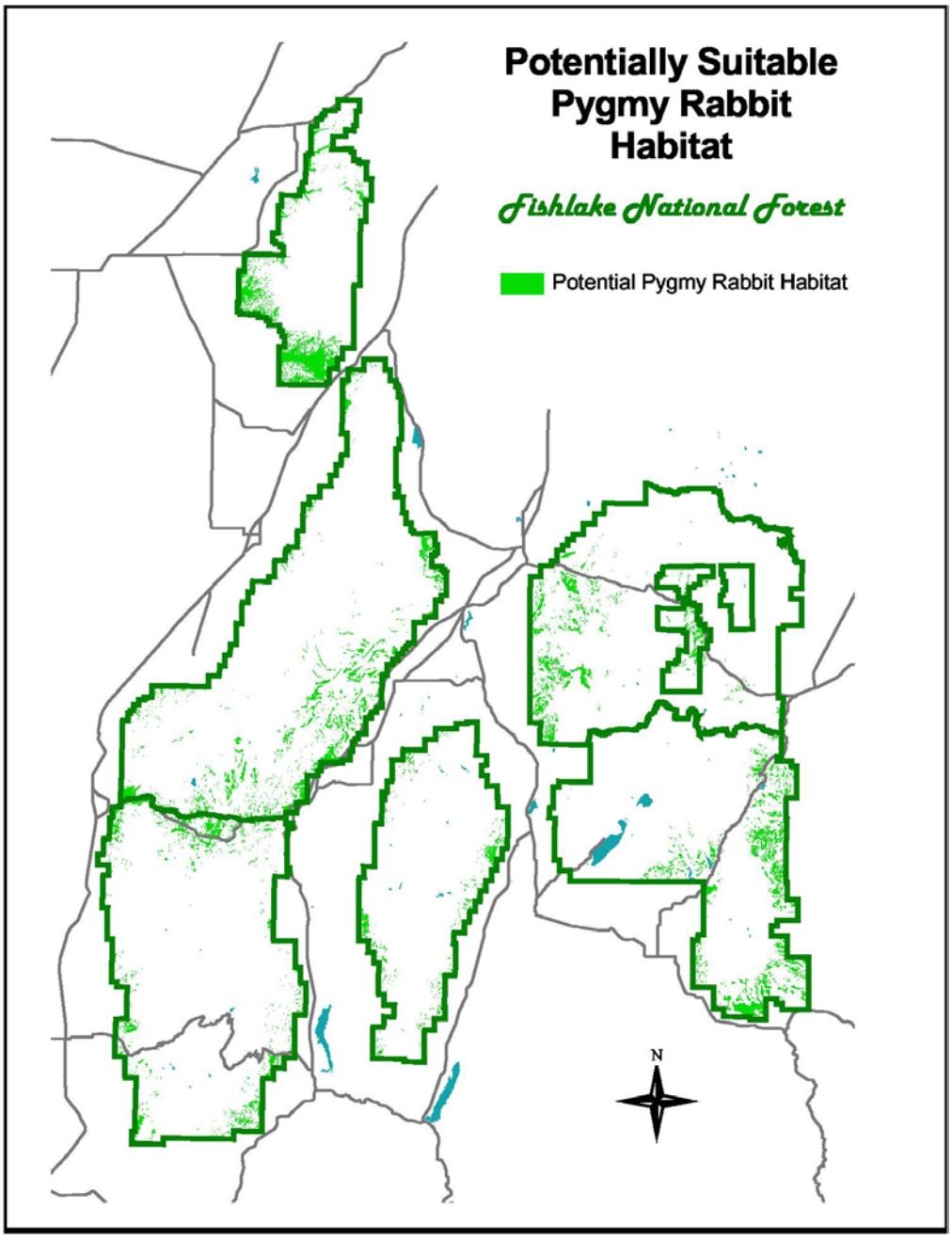
The gestation period of the pygmy rabbit is unknown; however, it is between 27 and 30 days in various species of cottontails (*Sylvilagus* spp.). An average of six young are born per litter and a maximum of three litters are produced per year. The growth rates of juveniles are dependent on the date of birth. Young from early litters grow larger due to a longer developmental period prior to their first winter. The mortality of adults is highest in late winter and early spring (Green and Flinders 1980b).

Weasels (*Mustela* spp.) are the principal predators of pygmy rabbits. Coyote, red fox (*Vulpes vulpes*), badger, bobcat, owls (*Bubo* spp.) and marsh hawk (*Circus cyaneus*) also prey on pygmy rabbits (Bradfield 1975, Green and Flinders 1980b).

Some populations of pygmy rabbits are susceptible to rapid declines, and possible local extirpation. Some studies suggest that pygmy rabbits are a "high inertia" species with low capacity for rapid increase in density (Weiss and Verts 1984). The loss of habitat is probably the most significant factor contributing to pygmy rabbit population declines. Protection of sagebrush, particularly on floodplains and where high water tables allow growth of tall, dense stands, is vital to the survival of pygmy rabbits (Flath 1994). Fragmentation of sagebrush communities also poses a threat to populations of pygmy rabbits (Weiss and Verts 1984) because dispersal potential is limited (Tesky 1994).

Because surveys are new and ongoing, a discussion addressing the health and distribution of this species is difficult. Therefore, a determination regarding trend and viability of pygmy rabbits on the Forest cannot be made at this time. Research is currently underway in cooperation with Brigham Young University to help obtain more information concerning distribution on the Fishlake Forest. Detections of this species have been made in areas where historic habitat had not been previously identified. In addition, the elevational range has been increased beyond what was originally thought to be suitable pygmy rabbit habitat. Surveys will be continued to determine range, distribution, and health of this species.

Displayed below is a map of potentially suitable pygmy rabbit habitat.


Potentially Suitable
Pygmy Rabbit
Habitat
Fishlake National Forest
Potential Pygmy Rabbit Habitat
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Below is a map of pygmy rabbit detections in Utah, 2003 (Natural Heritage Program data, 2003).